

# DEBATE RAGES ON DMSO DESPITE ITS USERS' CLAIMS

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AS with many other unproved substances with seemingly miraculous properties, DMSO has been dubbed alternately a panacea and a snake oil. The drug has also attracted a considerable cult following, enormous journalistic attention and highly profitable sales for unapproved uses.

The Food and Drug Administration has approved DMSO for only one medical use: to relieve the pain of a rare bladder disorder called interstitial cystitis. However, since DMSO is legally sold over the counter as an industrial chemical (as well as by veterinarian's prescription for a few animal problems), the Federal Government cannot stop people from buying and applying it for myriad conditions ranging in seriousness from sprained ankles to cancer.

It is most popular among professional athletes, who use it as a chemical hot-water bottle and contend that it gets them back into play within days of an injury; without it, they say, they have to sit on the sidelines for weeks while nature takes its time in healing. Patients suffering the crippling pain of arthritis have also given it considerable grass-roots support, although the Arthritis Foundation has repeatedly said that evidence of DMSO's effectiveness is lacking and has warned against unsupervised use of nonmedical preparations of DMSO.

DMSO - the initials stand for the chemical dimethyl sulfoxid - is a derivative of wood pulp used to PERSONAL HEALTH make paper that was first synthesized by a Russian chemist in 1866. In the 1940's it was developed commercially as an antifreeze and a solvent for paints, synthetic fibers and household cleaners. But it was nearly a century after its discovery before its medical potential was first realized. And now, almost 20 years and scores of studies later, the debate over its uses as a therapeutic agent rages more hotly than ever.

In the 1960's so much publicity was given to so many extraordinary claims for DMSO that the Food and Drug Administration has been unusually wary in permitting human tests, let alone approving the drug for widespread human use.

In addition, one of its incidental side effects - the ability to produce a powerful garlicky odor in users - has until recently stood in the way of properly designed human studies in which neither recipient nor researcher knows who is getting the "real" drug until the test is completed. Finally, the subjective nature of the response to DMSO's most popular use, the relief of pain, has made evaluation of clinical tests very difficult.

Anyone who may consider its use should consider what is known about the substance thus far. What It Is

DMSO is a slightly oily substance that rapidly penetrates the skin, its most popular route of administration. Within moments of applying it, the user experiences a garlic taste in the mouth, followed by a pungent odor on the breath that lasts four to six hours.

DMSO is sold in several forms: as a medically pure solution of 50 percent concentration (Rimso-50) available with a doctor's prescription; as a 90 percent solution for veterinary use; as a 99.9 percent solution in the industrial grade product that is sold over the counter and as experimental medical-grade solutions of various concentrations available only to physicians participating in federally approved studies.

DMSO's remarkable penetrating powers and transporting abilities are the basis for many of its proposed uses. It gets through the skin and into the bloodstream to interact with cells within moments of its application. It can also carry with it many small molecules, including certain drugs and various chemicals, dyes and pollutants, that may be on the skin. The Risks

The most widely used formulation is the industrial product, which is repackaged and repriced and sold in nonmedical outlets throughout the country, including health food stores, gasoline stations, antique shops, mail-order houses and airport gift shops, among many others. Thirteen states have laws allowing doctors to prescribe DMSO for various conditions not allowed by the Food and Drug Administration. The amount an industrial user obtains for \$1 may sell for \$18 in a health-food store.

But jacked-up prices are the least of the problems associated with the product. Although the bottle itself can make no medical claims for DMSO, it is often sold alongside books, magazines and pamphlets hailing its supposedly miraculous powers.

Physicians are concerned that some self-treaters will turn to DMSO in lieu of proven and properly prescribed medicines or may delay seeking medical assistance, ultimately making their condition worse. The American Cancer Society has called DMSO an "unproven method of cancer management" and has cautioned patients not to participate in DMSO therapy.

Furthermore, the industrial grade of DMSO has not been purified and is likely to be contaminated with potentially harmful substances, including cancer-causing chemicals, that DMSO would then carry into the body of the user.

Since no Federal agency supervises its preparation and packaging or examines the resulting product, industrial grade DMSO can easily become mixed with any number of toxic chemicals. Thus, physicians who are convinced of DMSO's therapeutic value urge all users to buy only the federally approved 50 percent solution. The veterinary preparation, though far more pure than the industrial grade, is still not up to the standards set for human use.

In laboratory animals, DMSO has caused eye damage, although no similar damage has yet been noted in people who have used it a long time. Large doses over a long period have also caused birth defects in animals, prompting a special warning to pregnant women to avoid using DMSO.

It has destroyed harmful antibodies in laboratory mice with an autoimmune disease caused by runaway antibodies, raising the possibility that it might also be capable of destroying protective antibodies. It can destroy red blood cells and prolong bleeding time. And its ability to enhance the action of other drugs may result in toxic reactions in patients taking medications like insulin, digitalis or steroids.

Many patients who use DMSO, especially in its more concentrated form, experience skin irritation and burns at the site of application. It may also cause welts and itching, drowsiness or lightheadedness, headache, nausea, diarrhea and, rarely, severe allergic reactions. Users are also warned to avoid wearing colored clothing after applying DMSO, lest the dye be carried into the body.

Still, as potent drugs go, pure DMSO thus far seems remarkably safe. The main hazards surround improper, unsupervised use. According to the Research Industries Corporation of Salt Lake City, the manufacturer of Rimso-50, the problem with odor and skin irritation may be largely solved by a newly developed combination of DMSO and urea - still in the experimental stage - patented by Robert Herschler, a chemist who has championed the DMSO cause with Dr. Stanley Jacob, an Oregon surgeon who first happened upon the chemical's therapeutic possibilities in 1962. The book "DMSO" by Barry Tarshis (William Morrow, \$10.95) was based on the files of these researchers. What It Can Do

Considering how long DMSO has been the subject of medical research, relatively few scientific facts have been established about it. Claims for its pain-relieving properties are largely based on testimonials. A special committee of the National Academy of Sciences found that studies to support such claims were scientifically inadequate.

Nonetheless, many stand behind its purported ability to relieve the discomfort of acute (as opposed to chronic) soft tissue damage, such as injury to muscles, tendons and ligaments.

For someone who needs to get back on his or her feet as soon as possible, DMSO seems to speed relief, although it may not actually hasten tissue repair. Herein lies the problem: If too much strain is placed too soon on an injured tissue, further damage may occur, and without the inhibitory effect of pain, a DMSO user may try to do too much too soon. In fact, a Colorado sports medicine specialist reported that tendons are more likely to tear within a week of DMSO use.

Dr. Arthur L. Scherbel, recently retired from the Cleveland Clinic, emphasizes that DMSO is a therapeutic agent that soothes rather than cures. Its effects are temporary and reversible and most obvious in conditions that, with time, would have cured themselves.

In arthritis, Dr. Scherbel said in an interview, DMSO "will alleviate pain in soft tissues faster than you'd get just by resting, but it won't change joint problems or inflammation."

A trial is nearing completion on DMSO's ability to heal ulcers in patients with an arthritislike disorder called scleroderma. The ulcers result when a tissue called collagen builds up and blocks blood vessels. DMSO supposedly dissolves the collagen, and preliminary reports from the federally sponsored trial are promising.

Because it is a powerful diuretic, DMSO has attracted considerable medical attention as a means of preventing dangerous swelling, such as occurs in the brain after a head injury, brain surgery or a stroke. Animal studies at the University of Texas Health Science Center in San Antonio suggest that DMSO can help to prevent brain damage or limit its extent if it is given soon after a head injury. Other researchers are studying its ability to limit damage after spinal cord injury.

But according to Dr. Scherbel, DMSO's greatest potential lies in its use as a carrier of other drugs, such as antiviral and anticancer agents and even arthritis medications. Studies are already being planned to test its ability to enhance the activity of drugs that attack herpes viruses.

To eliminate the research problem of patients knowing who is getting the real treatment and who is getting the placebo, researchers are using a very weak solution of DMSO for the control group. Though therapeutically ineffective, the solution nevertheless produces the garlicky breath odor, so that test subjects do not know who is getting which preparation until the test is completed.

Right now the bottom line in the DMSO story is this: Until further studies are completed and reviewed by the Food and Drug Administration for scientific validity, and until more is known about possible long-term hazards, those who self-treat with DMSO - and especially those who use over-the-counter versions of the product -are taking undetermined risks.

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